The following tables illustrate how these various benchmarking approaches compare. Table 7.1 compares how eligibility for high cost support is determined under each of the three approaches. Table 7.2 compares how (once the determination of eligibility is made) the amount of high cost support is determined. Finally, Table 7.3 shows how the existing federal high cost fund uses a sliding scale approach to target increasing levels of support to study areas with the highest costs. In addition, Appendix 7A displays the actual disbursements, by state, under the existing federal high cost fund.

Table 7.1
Benchmarks Vary for Determining Eligibility for High Cost Support

Benchmark	USF Plan
Does the LEC's average per-loop cost exceed 115% of the national average per-loop cost?	Existing FCC High Cost Fund (in effect)
Does the average per-loop cost computed by the proxy model exceed the price threshold?	Benchmark Cost Model (proposed)
Does the actual price exceed 150% of the statewide average price?	Vermont (proposed)

Table 7.2
Methods for Computing Amount of High Cost Support Vary

Method	USF Plan
Depends upon several factors, including number of lines in study area and the amount by which the cost exceeds the national average*	Existing FCC High Cost Fund (in effect)
For all CBGs where the cost exceeds the price threshold, multiply the number of households in the CBG times the difference between cost and price and add all of the individual CBG USF requirements for a total USF requirement	Benchmark Cost Model (proposed)
Provide support for the difference between the actual price and 150% of the statewide average price	Vermont (proposed)

*See Table 7.3 below.

Table 7.3

Existing FCC High Cost Fund*

Study Area with *Fewer than* 200,000 Working Loops:		
Relationship of Loop Cost in Study Area to the National Average Loop Cost	**Amount of Cost Covered by the HCF****	**Total Interstate Loop Allocation**
below 115%	0%	25%
between 115% and 150%	65%	90%
above 150%	75%	100%
Study Area with *More than* 200,000 Working Loops:		
Relationship of Loop Cost in Study Area to the National Average Loop Cost	**Amount of Cost Covered by the HCF****	**Total Interstate Loop Allocation**
below 115%	0%	25%
between 115% and 160%	10%	35%
between 160% and 200%	30%	65%
between 200% and 250%	60%	85%
above 250%	75%	100%

*Under the existing system of separations, 25% of costs are allocated to the interstate jurisdiction.

**The existing high cost fund covers the indicated percentages of the *unseparated* costs of loops.

Source: CC Docket 80-286, *Notice of Inquiry*, 9 FCC Rcd 7404 (1994).

7.2 Recommendations regarding the establishment of a benchmark for determining eligibility and the method for computing USF support

We do not disagree, in principle, that the price charged for basic service is more relevant to a customer's decision as to whether to become or stay connected to the public

switched network than is the theoretical cost of that connection. Nonetheless, there is a serious possibility that setting a price-based benchmark for the universal service support requirement will simply defer the cost issue to another day, i.e., when the regulator must review the reasonableness of the particular price being charged by a dominant local exchange carrier. Until such time as the provision of basic local exchange service in an area is sufficiently competitive, the price for that service presumably remains under scrutiny by the regulator and, absent cost data, the regulator has no way of evaluating the reasonableness of the price.[181] Therefore, while an examination of the existing prices throughout a state for telecommunications services and the corresponding subscribership levels is critical to establishing the level of "affordable" rates, the rates alone should not drive the determination of the amount of universal service support.

Regarding the method for computing assistance, it is important to recognize that a cost proxy model yields an objective measure of the high cost support that *may* be necessary in order to assure the provision of affordable service and to satisfy the Congressional goal that the price in rural areas be "reasonably comparable" to the price in urban areas. However, there are several offsetting sources of revenue *in addition to the basic monthly access line rate itself* that would cover the shortfall in most high cost areas. Once such revenue is properly recognized, it becomes apparent that either there is no need at all for explicit high cost support, or that the areas that qualify for high cost support are much more limited and less costly to fund than otherwise estimated, certainly far less than the total amount that has been, to date, computed by the BCM.

7.3 Federal and state policy makers should coordinate USF plans to ensure that in no event is more than 100% of "high cost" recovered by USF support

The effort to unravel existing sources of universal service support and then to size explicit universal service funds raises the issue of jurisdictional responsibility for high cost areas. As discussed above, the existing federal universal service fund covers costs over and above the "standard" 25% interstate allocation for above-average-cost regions of the country, with the eligibility for and amount of funding determined with reference to cost levels across entire study areas. When cost levels are examined at a more granular level, such as an individual wire center serving district or, as many incumbent LECs favor, at a CBG level, the sheer variability of costs would virtually guarantee that the number of "areas" that exceed any given high cost threshold will increase dramatically. All else being

181. If, instead, the dominant carrier could set price without any regard whatsoever to cost then there would be a clear incentive to raise prices above the statewide average.

equal, greater granularity will in and of itself result in a larger funding requirement to be satisfied at both the federal and state levels.[182]

A key policy question yet to be addressed is which jurisdiction should bear the burden for supporting high cost areas, *particularly where differing definitions of universal service and varying degrees of granularity are involved.* At present, the federal high cost mechanism picks up the substantial majority of the unseparated line costs for study areas with costs exceeding the national average. With the comprehensive reexamination of universal service funding, the manner in which the federal and state jurisdictions split overall responsibility for universal service support is in flux. While the *Telecommunications Act* requires the FCC to establish a definition of universal service and a "national affordable" rate level, it is possible that a state PUC may have the discretion to adopt a different definition or affordability threshold.

At a minimum, some kind of allocation of USF responsibility will be necessary between the federal and state jurisdictions. If one were starting with a blank slate, it is not readily apparent how the jurisdictional responsibility would be apportioned.[183] For example, suppose that the total per-line cost for a particular area is $35, and the FCC determines that the "supported" price for that area should be $30 but, for the same area, the state commission determines that the "supported" price should be $25. In this example, federal universal service support might be based upon a cost-price difference of $5 per line ($35 cost minus $30 price). If we assume an allocator of 25% to the federal side, the federal USF would therefore be responsible for supporting $1.25, which implies that a state USF would be responsible for supporting the remaining $3.75. In our example, however, the state also seeks to support another $5.00 per line per month, and therefore the total state USF requirements in this example would be $8.75 per line.[184] The *Telecommunications*

182. The rationale that incumbent LECs advance in support of increased granularity in reporting and applying universal service costs is that this is the level of deaveraging that is confronted by competitors when they consider entry into a particular geographic area. This "cream skimming" accusation has been made by incumbent telecommunications utilities for decades, but the fears have never been borne out in actual practice. The various entities that are now in the process of pursuing entry into the local exchange service market are large firms that are counting upon their ability to amass a large, geographically diverse market base, not isolated market niches that would only be profitable for small, specialized providers.

183. The existing High Cost Fund provides some kind of precedent. See Table 7.3 above for details on the existing jurisdictional responsibility for high cost support.

184. If the state establishes an excessively low supported price though, such a decision could thwart the competitive goals of the *Telecommunications Act* (by creating a relatively larger burden for new entrants). Note, too, that while the *Telecommunications Act* allows a state to "provide for additional definitions and standards to preserve and advance universal service within that State only to the extent that such regulations adopt specific, predictable, and sufficient mechanisms to support such definitions or standards that do not rely on or burden Federal universal support mechanisms." *Telecommunications Act*, Sec. 254(f). This means (as the example

(continued...)

Act considers this possibility and specifies, as a condition for allowing states to adopt definitions or regulations that lead to universal service support requirements that are broader than under the federal rules, that the state's regulations also "adopt additional specific, predictable, and sufficient mechanisms to support such definitions or standards that do not rely on or burden Federal universal service support mechanisms."[185] Thus, while the FCC is responsible for determining the federal USF support that is required, the federal guidelines clearly have direct implications for, and may work to constrain, state USF policy.

7.4 If a new universal service funding mechanism is established, other existing sources of support should be either eliminated or reduced

As we noted in Chapter 1, the Joint Sponsors of the BCM did not submit any information regarding how the results of the BCM would be used other than as a way to inform the high cost proceeding. The FCC, in implementing the recommendations of the Joint Board, is expected to adopt an explicit funding mechanism that meets the specific objectives set forth in the *Telecommunications Act*, and the BCM, ideally after the types of adjustments we recommend have been made, may form the core of this new universal service support mechanism. However, before any recovery of universal service costs begins to occur through a new universal service mechanism, the FCC must systematically identify all existing sources of universal service support (both explicit and implicit) that are redundant to this new fund, and must ensure that any duplication of support is eliminated from rates and/or funding mechanisms in the federal jurisdiction. A similar systematic approach will need to be undertaken with regard to any state sources of universal service support.

7.5 Revenues from other services linked to the provision of residential dial tone lines will offset much of the USF requirement

All of the foregoing discussion in the previous chapters of this report has focused on how to identify instances in which the costs to provide universal service to residential customers exceed a specified level of affordability; after all, a detailed analysis of costs and how they are modelled by the BCM is the core purpose of this report. However, it is important to recognize that costs are only one side of the equation. Before the BCM or any other costing study is used as a basis for dispensing support, it is critical that the revenue

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184. (...continued)
demonstrates) that if a state decides to support a lower affordability threshold or a broader set of services than those supported under the federal mechanism, the state cannot allocate a share of the additional funding burden to the federal jurisdiction.

185. *Id.*

side of the equation be considered. There are a number of sources of revenue that LECs receive from their provision of primary residential dial tone lines. Some of these revenues are appropriately considered in determining the extent of any revenue shortfall that would require subsidization from the fund, while others are included in determining the relative contribution that each telecommunications provider will be required to make to the fund so as to make up the shortfall. What follows is a brief discussion showing how revenues can offset much of the universal service requirement.

It is widely acknowledged that, today, implicit subsidies within the LECs' rate structures and Yellow Pages revenues, an explicit subsidy, are sources of support for universal service. It is frequently asserted, however, that competition will erode the very revenues that incumbent LECs have relied on to support universal service at affordable rates. This argument ignores the fact that certain revenue sources available to incumbent LECs, such a Yellow Pages, are distinctly not affected by competition for local exchange service and that other revenues, from services linked to the provision of a dial tone line, remain tied to that service (and, thus, available to support universal service) whether the customer remains with the LEC or takes local service from a competing provider. It is quite possible that these revenues substantially, if not entirely, offset any universal service funding requirement derived on the basis of costs alone.

In most states, Yellow Pages directory revenues have long been used as a source of financial support for basic local exchange telephone service, principally (but not exclusively) the residential "dial tone" exchange access line. When the Court overseeing the divestiture of the Bell operating companies from AT&T in 1982 considered whether the Yellow Pages businesses should remain with the local companies or go to AT&T (along with various competitive businesses), the BOCs, many state public utilities commissions, and the National Association of Regulatory Utility Commissioners argued strongly for the retention of the Yellow Pages business by the BOCs *expressly because of the enormous amount of revenue that was contributed by Yellow Pages to support basic exchange access services.* Based on these arguments, the Court decided to retain the link that allowed Yellow Pages revenues and residential service, on the ground that Yellow Pages "provide a significant subsidy to local telephone rates [that] would most likely continue if the [BOCs] were permitted to continue to publish the Yellow Pages."[186] Nothing has occurred to change the public policy basis for this affirmative judicial finding that the profits from the publication of these directories should be used to defray a portion of the cost of providing basic local telephone service.

Yellow Pages was not a competitive business at the time of divestiture and, fourteen years later, it still remains a monopoly business of the incumbent LECs. Despite the absence of legal barriers to competition, Yellow Pages is the type of business activity that

186. *United States. v. American Tel. & Tel. Co.*, 552 F. Supp. 131, 193-194 (D.D.C. 1982).

typically has only a single provider, due to the presence of formidable, perhaps even insurmountable, economic entry barriers. Shortly after the divestiture, there was a flurry of competitive activity in the Yellow Pages area.[187] Significantly, and notwithstanding the fact that these ventures were initiated by well-financed firms with considerable experience in and knowledge of the directory publishing business, none of them has succeeded in making any consequential inroads into this market.

LECs obviously resist the imputation of Yellow Pages revenues to support basic regulated telephone services, as it is an extremely profitable business. Recently, some LECs have argued that this practice raises competitive issues, since no other competitors have a similar requirement placed on them although these other companies also have may unregulated affiliates that profit from their corporate relationship. However unlike potential publishing competitors or local exchange service competitors with affiliated businesses, the directory publishing businesses of incumbent LECs enjoy a unique and direct benefit by being associated with the LECs' *regulated monopoly telecommunications services.*

In addition to the historic basis for using Yellow Pages revenues as a source of universal service support, there are compelling economic justifications for this policy as well. Yellow Pages directories serve primarily *local* markets. That is, the Yellow Pages directory for a given city, which contains listings of businesses and professionals offering products and services in that community, are utilized almost exclusively by *local* telephone subscribers in that immediate area. The local Yellow Pages directory is distributed without charge to all households and businesses in the coverage area. Like other advertising media, the willingness of advertisers to pay for their listings and ads is directly related to the *circulation* of the book; put another way, the *value* of the Yellow Pages directory to the incumbent LEC is directly related to the total number of telephone subscribers in the coverage area.[188] Moreover, that value is not diminished merely because some individual subscribers may elect to take their dial tone service from a competing local carrier. As Yellow Pages telephone directory derives its value, both to advertisers and to the LEC that publishes it, directly from the existence of near universal connectivity to the local network, and it is both appropriate (from a policy standpoint) and economically reasonable for the substantial profits generated by the incumbent LEC from Yellow Pages advertising to support the overall universal service goal. For all these reasons, ratepayers should continue

187. For example, Southwestern Bell's directory publishing affiliate tried to compete with New York Telephone by offering its own Manhattan Yellow Pages. Donnelley Directory, a division of the R. H. Donnelley Company, a firm that had long been in the business of publishing and marketing Yellow Pages directories under contract with Bell and non-Bell local telephone companies, attempted to enter the Yellow Pages business in several markets.

188. The use of advertising revenues to "pay" a portion of the costs of products and services used by consumers is extremely common: Newspapers, magazines, radio and television broadcasters, and other media use these revenues to subsidize the content of their publications; consumers pay for that content indirectly, through the prices of the various goods and services they purchase from the companies that advertise.

to receive the benefit of Yellow Pages revenues, and such benefit should be used in particular as an explicit offset against any universal service requirement for basic telephone service.

In order to maintain the Yellow Pages contribution as support for affordable residential service generally and to prevent it from simply becoming a means of enhancing the incumbent LEC's competitive position in the residential dial tone market, the contribution (expressed on a per-primary-access-line basis) should be spread across all primary residential access lines, irrespective of which certificated local carrier provides the service. Non-dominant CLECs (who do not publish their own directories and whose customers are included in the incumbent's White and Yellow Pages directories) should be credited with an amount that reflects the Yellow Pages contribution, expressed on a per-line basis, multiplied by the number of primary residential access lines that they provide.[189] CLECs should be allowed to use this per-line "credit" to offset its universal service fund payment obligations or, alternatively, to pay any interconnection charges or other payments to the incumbent LEC that it is required to make.

In addition, costs associated with the provision of universal service should also be adjusted to reflect revenues produced by services and rate elements that are an integral part of the basic residential service offering, but that are often separately priced (although in no sense "optional" or "discretionary" with respect to the central connectivity purpose of a primary residential access line). Examples of rate elements that meet this definition include the basic monthly residential primary line exchange service rate, flat or measured local usage and Extended Area Service (EAS) charges, and any intrastate end user common line (EUCL) charge, as well as the interstate Subscriber Line Charge (SLC) and Carrier Common Line Charge (CCLC), so long as they continue to exist.

It is appropriate to recognize and offset these revenues from the costs of providing universal service, because consumers pay for telephone service pursuant to a complex rate structure, in which individual elements bear widely varying relationships with cost. The "price" that a consumer pays for his telephone service is not the amount of any one, individual rate element (like the basic monthly dial tone line rate), but is instead the *total* charge for the package of basic residential service components, no matter how these may be structured. That "price" consists of many elements, including the monthly residential (1FR or 1MR) access line rate, the interstate SLC, local calling usage charges, directory assistance charges, and the interstate SLC and CCLC switched access rate elements. The relationship between the *rate* applicable for each of these *rate elements* and the cost of each such element (to the extent that such a cost can even be separately identified) is highly

189. Since a customer will be entitled to purchase one and only one primary residential access line per legal dwelling unit, if a customer takes service from two or more local service providers, the customer will be required to designate one carrier as the provider of the subsidized primary access line service.

variable, reflecting a mixture of public policy and marketing considerations. It would be fundamentally incorrect to compare the *costs* of providing primary residential access line service with the revenues associated with only selected rate elements of a multi-element "price." Instead, the comparison must be made holistically to the aggregation of all components of the "service" that is furnished to the residential subscriber *irrespective of how that service happens to be priced.* All that is relevant is the *totality* of the rate and service elements that comprise the service that is actually furnished to and purchased by the residential subscriber; extraction of individual components in isolation can provide a seriously distorted — and quite irrelevant — picture of the cost/revenue relationship that is being examined.

Finally, in addition to the two classes of revenues discussed above, the LECs also receive revenues from optional and discretionary services and from services that can exist independently of the residential dial tone line, including all nonresidential services. Examples of revenues in this category include intraLATA and interLATA toll, custom calling and CLASS services, inside wire maintenance, interstate and intrastate switched access charges (other than the CCLC), and voice mail services. While such revenue sources are not so tied to the provision of basic residential service as to require that they be used directly to offset universal service costs, these revenues should be included in the valuation base used to determine the LEC's share of the aggregate universal service fund contribution.

Appendix 7 | STATE SUMMARY DATA FOR 1993

National Exchange Carrier Association
Universal Service Fund
State Summary
Data for 1993

STATE	UNSEPARATED NTS REVENUE REQUIREMENT	NUMBER OF LOOPS	UNSEPARATED NTS REVENUE REQUIREMENT PER LOOP	UNIVERSAL SERVICE FUND PAYMENTS FOR 1995	PERCENT OF TOTAL
ALABAMA	$561,802,757	2,072,664	$271.05	$22,429,380	2.994%
ALASKA	$127,408,813	330,054	$386.02	$31,439,297	4.196%
ARIZONA	$565,291,088	2,191,208	$257.98	$14,700,548	1.962%
ARKANSAS	$391,194,713	1,164,917	$335.81	$37,031,406	4.943%
CALIFORNIA	$4,011,258,083	18,888,204	$212.37	$43,832,151	5.851%
COLORADO	$488,956,961	2,191,528	$223.11	$4,173,864	0.557%
CONNECTICUT	$430,645,791	1,856,765	$231.93	$0	0.000%
DELAWARE	$92,914,023	446,623	$208.04	$0	0.000%
DISTRICT OF COLUMBIA	$63,859,291	838,869	$76.13	$0	0.000%
FLORIDA	$2,612,204,586	8,580,752	$304.43	$28,824,601	3.847%
GEORGIA	$1,179,254,977	3,808,241	$309.66	$27,488,315	3.669%
HAWAII	$158,348,777	664,306	$238.37	$0	0.000%
IDAHO	$165,003,830	549,518	$300.27	$20,334,299	2.714%
ILLINOIS	$1,138,783,853	6,981,697	$163.11	$4,130,588	0.551%
INDIANA	$675,181,515	2,972,600	$227.14	$3,791,831	0.506%
IOWA	$284,351,134	1,434,100	$198.28	$5,277,276	0.704%
KANSAS	$378,855,117	1,379,908	$274.55	$21,554,573	2.877%
KENTUCKY	$506,208,978	1,754,734	$287.91	$9,424,023	1.258%
LOUISIANA	$653,473,922	2,101,558	$310.95	$30,865,017	4.120%
MAINE	$223,595,233	699,372	$319.71	$5,714,205	0.763%
MARYLAND	$600,755,856	3,005,368	$199.89	$0	0.000%
MASSACHUSETTS	$841,585,584	3,804,245	$221.22	$2,421	0.000%
MICHIGAN	$1,187,855,905	5,324,312	$223.10	$12,514,134	1.670%
MICRONESIA	$6,868,878	13,618	$504.40	$2,147,728	0.287%
MINNESOTA	$538,624,606	2,532,881	$212.65	$7,654,248	1.022%
MISSISSIPPI	$390,220,752	1,136,798	$343.26	$13,058,113	1.743%
MISSOURI	$733,286,809	2,847,192	$257.55	$64,047,058	8.549%
MONTANA	$134,927,864	443,838	$304.00	$10,331,463	1.379%
NEBRASKA	$183,778,362	889,112	$206.70	$5,134,155	0.685%
NEVADA	$167,811,342	881,666	$189.99	$2,852,739	0.381%
NEW HAMPSHIRE	$224,286,212	675,193	$332.18	$4,971,168	0.664%
NEW JERSEY	$1,011,525,914	5,279,728	$191.59	$0	0.000%
NEW MEXICO	$233,624,880	792,240	$294.89	$19,369,573	2.585%
NEW YORK	$2,790,881,812	11,238,447	$248.31	$13,547,182	1.808%
NORTH CAROLINA	$1,113,004,806	3,797,826	$293.06	$23,886,133	3.188%
NORTH DAKOTA	$96,521,417	371,697	$256.99	$3,956,508	0.528%
OHIO	$1,294,193,096	5,797,159	$216.36	$2,357,232	0.315%
OKLAHOMA	$466,236,047	1,684,233	$276.82	$24,947,417	3.330%
OREGON	$444,990,066	1,666,747	$266.98	$12,803,489	1.709%
PENNSYLVANIA	$1,420,966,282	7,006,700	$202.80	$1,570,975	0.210%
PUERTO RICO	$364,063,873	1,087,468	$334.83	$14,168,913	1.891%
RHODE ISLAND	$121,503,026	565,730	$214.77	$0	0.000%
SOUTH CAROLINA	$632,652,759	1,787,175	$354.00	$23,958,490	3.198%
SOUTH DAKOTA	$89,920,773	363,411	$247.44	$3,186,328	0.425%
TENNESSEE	$714,967,044	2,760,575	$258.99	$3,702,525	0.494%
TEXAS	$2,587,469,683	9,729,523	$265.94	$89,902,108	12.000%
UTAH	$172,905,844	886,130	$195.12	$2,409,972	0.322%
VERMONT	$129,400,061	341,730	$378.66	$5,582,969	0.745%
VIRGIN ISLANDS	$33,046,155	55,411	$596.36	$12,560,701	1.677%
VIRGINIA	$896,306,626	3,673,662	$244.53	$3,548,054	0.474%
WASHINGTON	$694,665,956	2,956,810	$234.78	$22,241,194	2.969%
WEST VIRGINIA	$303,967,614	849,875	$357.66	$19,573,487	2.613%
WISCONSIN	$629,378,264	2,808,407	$224.11	$7,705,261	1.028%
WYOMING	$92,588,956	255,918	$361.79	$4,492,193	0.600%
INDUSTRY TOTAL:	$36,002,856,970	148,190,420	$242.95	$749,196,095	100.000%

TOTAL NUMBER OF STUDY AREAS: 1439

8 THE MAGINITUDE OF THE UNIVERSAL SERVICE FUNDING REQUIREMENT

8.1 Aggregate effect of correcting the BCM

We analyzed the implications of correcting several inputs in the BCM by rerunning the model with some of the revisions discussed in detail in Chapter 5 and Chapter 6. These revisions partially correct the model in order to better simulate a proxy network that provides a single line to each household.[190] The analysis that follows (displayed in the accompanying tables) summarizes, in two scenarios, the output data that result from the combined recommendations contained in the previous chapters. The two scenarios show results with and without an adjustment for the subscribership rate. These two scenarios — which we ran for the State of Washington — use the following ETI partially corrected data and assumptions:[191]

Without adjustment for subscribership:

- A cost factor of 22.97%, i.e., "Cost Factor 2" which, as a forward-looking cost factor, is more appropriate for the cost proxy model than the historical "Cost Factor 1."

- Effective per-line switch costs of $167 to correct the BCM's implausibly high switch cost;[192]

- Objective distribution fill factors of 95% for all density zones;

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190. The differential between the cost results of the BCM (using default values and algorithms) and the results of a fully corrected run represents the approximate cost of meeting non-universal service demand, e.g., second residential lines and business lines.

191. See Appendix 8B for the BCM's print-out of the results pages of the partially corrected BCM.

192. This means that ETI eliminated the $647,526 common processor cost, and that, therefore, the following factors became irrelevant in the BCM: the 79% allocation and the 1.75 business gross up factor.

- Objective feeder fill factors of 95% for all density zones;
- An adjustment to the structure multiplier in rural areas; and
- Objective SLC and AFC fill factors of 95%.

With adjustment for subscribership:

- All of the previous corrections; and
- We divided the average cost per line by 0.960 (the subscribership rate in Washington) to reflect the fact that universal service objectives require the accessibility by all households of affordable basic local exchange service, but not all households subscribe.[193]

The results of our corrections yield cost data that are upper bounds to the cost that would result if it were feasible to implement all ETI corrections. The partially corrected average cost of $12.58 per month[194] for the State of Washington should be reduced further for the following reasons:[195]

- The BCM does not make the copper/fiber crossover decision in an economic manner.
- The assumption of uniform density within a CBG is incorrect and results in an overstatement of the cost of serving the average customer within each CBG.
- We made no correction for the inflated SLC and AFC costs nor the correspondingly low SLC and AFC discounts.

Moreover, the amount of universal service requirement is overstated for the following reasons:

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193. Those that do not subscribe to service necessarily are not making any payment for telephone service, yet the network is configured to be ready to serve them. We did not make this correction in isolation but rather incorporated it into the final "partially corrected" run of the BCM. (Our analysis made this adjustment by taking the column of final BCM-computed cost results and dividing it by 0.960 before determining universal service requirements.)

194. See Appendix 8B.

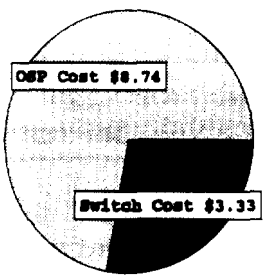
195. The BCM does not yet include the SAI (which likely would lead to an increase of less than a half-dollar).

- The aggregate requirements are based upon average costs in each CBG that, despite the ETI partial corrections, are still too high.

- After the BCM completes its computation of CBG costs, it should then aggregate these results to the wire center level before the need for universal service support is evaluated. Because the method in the BCM is to assess universal service requirements at the CBG level, the final results of the BCM are overstated.

Similar to Figure 5.1 in Chapter 5, the ETI partial corrections still show that, not surprisingly, the outside plant comprises the majority of the overall line cost. The ETI partial corrections show that 72% of the overall line cost is attributed to outside plant, while the switch cost accounts for 28% of the overall cost.[196] In comparison, the BCM results for Washington State produce an overall average cost of $16.94 which consists of $11.31 outside plant cost (67%), and a $5.63 switch component (33%).

Figure 8.1
Outside Plant Costs Comprise the Majority of Line Cost
(Monthly)



Note: Assumes cost factor of 22.97%
Source: Washington State BCM Results, ETI Partial Corrections

As Table 8.3 shows, based upon ETI corrections that were feasibly incorporated into the BCM, the corrected BCM yielded annual universal service support requirements for the State of Washington that range between approximately $11-million and $29-million, depending upon the price threshold. These results were less than half of the levels computed by the uncorrected BCM.

196. For this analysis we used ETI partial corrections without the correction for penetration rate.

Table 8.1

The BCM Overstates the USF Requirement
Data for Washington State
without Adjustment for Subscribership

	BCM	**ETI Partially Corrected BCM**	**Percent Difference**
Average Monthly Cost	$16.94	$12.08	(29%)
Total USF Requirement (Annual)	$50,692,630	$15,768,466	(69%)

Notes: USF requirement figures reflect a price threshold of $30 per month and a cost factor of 22.97%. See Appendix 8B.

In Table 8.1, we see that the USF requirement is reduced dramatically by the ETI partial corrections. Clearly the "need" calculated by the BCM is overstated. Moreover, we observe that the effect of the ETI partial corrections has a greater effect on the total USF requirement (69% reduction) than on the average monthly cost (29% reduction). From this finding, we can infer that the inadequacies of the BCM are predominantly related to the pricing of high-cost areas.

Table 8.2

The BCM Overstates the USF Requirement
Data for Washington State
Including Adjustment for Subscribership

	BCM	**ETI Partially Corrected BCM**	**Percent Difference**
Average Monthly Cost	$16.94	$12.58	(26%)
Total USF Requirement (Annual)	$50,692,630	$17,429,545	(66%)

Notes: USF Requirement figures reflect a price threshold of $30 per month and a cost factor of 22.97%. The BCM does not include an adjustment for subscribership rate. See Appendix 8B.

Similar to Table 8.1, Table 8.2 displays ETI's partial corrections, but in addition, incorporates an adjustment for the penetration rates: Those who are not being provisioned phone service are not contributing to the overall costs. Thus, the costs cannot be spread over the entire population, but merely those who subscribe, which in Washington State, is 96.0% of the households. The BCM does not account for this adjustment. However, to allow us to develop a factor by which we can extrapolate from the Washington State data to the national level, Table 8.3 only reflects a penetration adjustment for the ETI corrections. As an illustration, BCM costs that include a correction for penetration rate would yield a state average cost of $17.65 a month ($16.94/0.96) and a total USF requirement of $53,086,072 ($50,692,630/0.96). Even correcting for the penetration rate, a correction which presumably adds costs to those who do subscribe, our analysis still shows a difference of more than 60% between the USF support calculated by the BCM and ETI's partial corrections.

Table 8.3

Comparative Summary Results of the BCM
and the ETI Partially Corrected BCM
Washington State

	BCM	ETI Partial Corrections	Percent Difference
Annual Benchmark Cost	$380,427,268	$282,552,902	26%
Support at $20	$77,846,835	$29,230,056	62%
Support at $30	$50,692,630	$17,429,545	66%
Support at $40	$37,662,589	$11,430,572	70%
Average Monthly Cost	$16.94	$12.58	26%

Notes: ETI partial corrections include adjustment for penetration rate. See Appendix 8B.

Table 8.3 displays the effect of ETI's partial corrections for the three universal service support levels and for cost data. Most notably, ETI's corrections show a requirement for universal service support of 62% to 70% less than that computed by the uncorrected BCM depending upon the support threshold level. Consistent with our previous analysis, the effects of ETI's calculations show greater reductions for USF support than for the annual benchmark cost and average monthly cost. This again supports the conclusion that ETI's corrections disproportionately remedy inadequacies in how the BCM calculates support for rural areas which tend to be the most important in determining high cost support.

Table 8.4

Comparative Summary Results of the BCM
and the ETI Partially Corrected BCM
National Total (excluding Alaska)

	BCM	**ETI Partial Corrections**
Annual Benchmark Cost	$18,402,608,162	$4,784,678,122
Support at $20	$3,977,572,193	$1,511,477,433
Support at $30	$2,203,441,910	$749,170,249
Support at $40	$1,372,205,121	$411,661,536
Average Monthly Cost	$16.71	$12.37

Note: Adjustment factors based upon a comparison of BCM and ETI results for Washington are used to create national ETI results.

Due to the time constraints associated with running the BCM for the entire country, we examined the ratios of the ETI results to the BCM results for Washington State in order to develop very approximate "national adjustment factors." The purpose of developing these national adjustment factors is to yield approximations of the national results, assuming that ETI's corrections were implemented by the Commission. The results of applying these adjustment factors to the BCM yields national numbers which are shown in Table 8.4. We recommend, however, that the entire country be run with the ETI corrections on a state-by-state basis.

Appendix 8A | SUMMARY OF MAJOR ETI RUNS OF THE BCM

Summary of Major ETI Runs of the BCM

1(a) We changed the per-line switch cost to $167. Other than setting the common processor costs at zero this run involved no changes to the BCM's assumptions, and thus the results isolate the effect of reducing the BCM's overstated switch costs.

1(b) As a sensitivity analysis, we revised the switch cost data to reflect an effective cost of $134 per line.

2(a) We changed the fill factor for the feeder and distribution plant to 95% for all household densities, and changed the structure multipliers by a relatively high amount.

2(b) We changed the fill factor for the feeder and distribution plant to 95% for all household densities, and changed the structure multipliers by a moderate amount.

2(c) We changed the fill factor for the feeder and distribution plant to 95% for all household densities, and used the BCM's default structure multipliers.

3. We conducted a sensitivity analysis of the digital loop equipment costs. Specifically, we reduced the SLC cost to $250, the SLC discount to 40%, the AFC cost to $500, and the AFC discount to 25%. For this run, we used the BCM's default fill factor of 80% for the SLC and AFC. We made no other changes to the BCM.

4. We analyzed the effects of implementing the following corrections simultaneously:

   - Per-line switch cost of $167.
   - Fill factor of 95% for the distribution and feeder plant in all density zones.
   - Moderate adjustment to the BCM's structure multiplier to reflect effect of increasing the fill factor to 95%.
   - BCM default costs for the SLC and AFC.
   - Fill factor of 95% for the SLC and AFC.

- BCM's default crossover of 12,000 feet for fiber.

5. This run includes all of the changes identified for Run No. 5 and an adjustment for the subscribership level. We divided the average cost per line by 0.960 (the subscribership rate in Washington) to reflect the fact that universal service objectives require the accessibility by all households to affordable basic local exchange service, but not all households subscribe (i.e., those that do not subscribe to service necessarily are not making any payment for telephone service, yet the network is configured to be ready to serve them).

Runs No. 5 and No. 6 represent "partially corrected" results because they do not adjust for many of the flaws in the model. See Chapter 10.

6. This analysis entails two runs that analyze the implications of increasing the household count to reflect the presence of businesses. As is discussed in more detail in Chapter 6, the low fill factors that are incorporated in the BCM likely reflect the volatility associated with providing telecommunications services other than first line, basic residence local exchange service, e.g., business lines and additional residence lines. However, although the BCM reflects the volatility of business lines, among other things, through the Joint Sponsor's assumption of low fill factors, the business lines themselves are not reflected in the BCM. Thus the BCM is internally inconsistent. We tested the implications of leaving the BCM's low fill factors intact, but increasing the lines served in the model by a gross-up factor of 1.44[1] in order to make the BCM more consistent internally.

   6(a) *High volatility, low fill*: Specifically, for each CBG we multiplied the number of households served by 1.44 before the model "sizes" the outside plant. In this sensitivity analysis we used the switch cost of $134, and the BCM's default fill factors, and made no other changes to the model.

   6(b) *Low volatility, high fill*: We compared the results of the previous "high volatility, low fill" run with the "low-volatility" assumptions, i.e., 95% fill, the highest of the adjustments to the structure costs, and a switch cost of $134.

1. This figure of 1.44 is the ratio of all lines in the state of Washington to the number of households in the state of Washington. The number of residential lines is 2,062,385. FCC Statistics of Common Carriers, 1994-1995, Table 2.5. The number of households with second lines is 7.2%. **cite. The subscribership rate in Washington State is 96%. **cite. Therefore, using these same data yields a computed number of households of 2,004,028 (i.e., [2,062,385 divided by 1.072] divided by 0.96). The total number of lines (including second lines, business lines, and public access lines is 2,881,344. Statistics of Common Carriers, 1994-1995, Table 2.5. Thus, the ratio of the total number of lines to the number of households is 1.44

Appendix 8B | ETI's PARTIAL CORRECTIONS AND SENSITIVITY ANALYSIS BCM: WASHINGTON STATE

Density	Data	Total
<=5	Sum of # Households	62,645
	Average of Loop Length	81,872.32
	Average of Loop $ per HH	4,513.14
	Average of Total Invstmnt/Ln	5,176.39
>2550	Sum of # Households	364,583
	Average of Loop Length	8,070.19
	Average of Loop $ per HH	218.26
	Average of Total Invstmnt/Ln	479.26
200 to 650	Sum of # Households	273,086
	Average of Loop Length	15,153.19
	Average of Loop $ per HH	430.99
	Average of Total Invstmnt/Ln	717.90
5 TO 200	Sum of # Households	372,988
	Average of Loop Length	28,234.15
	Average of Loop $ per HH	1,003.67
	Average of Total Invstmnt/Ln	1,356.13
650 to 850	Sum of # Households	109,294
	Average of Loop Length	12,680.94
	Average of Loop $ per HH	332.85
	Average of Total Invstmnt/Ln	604.04
850 to 2550	Sum of # Households	689,169
	Average of Loop Length	11,045.12
	Average of Loop $ per HH	323.62
	Average of Total Invstmnt/Ln	589.75

Density	Data	Total
<=5	Average of Monthly Cost1	136.64
	Average of Monthly Cost2	99.08
>2550	Average of Monthly Cost1	12.65
	Average of Monthly Cost2	9.17
200 to 650	Average of Monthly Cost1	18.95
	Average of Monthly Cost2	13.74
5 TO 200	Average of Monthly Cost1	35.80
	Average of Monthly Cost2	25.96
650 to 850	Average of Monthly Cost1	15.95
	Average of Monthly Cost2	11.56
850 to 2550	Average of Monthly Cost1	15.57
	Average of Monthly Cost2	11.29

	ARMIS	DIRECT
Aggregate Support at $20=	$ 158,350,839	$ 77,846,835
Aggregate Support at $30=	$ 97,982,543	$ 50,692,630
Aggregate Support at $40=	$ 72,368,201	$ 37,662,589
Annual Benchmark Cost =	$ 524,623,612	$ 380,427,268
State Average Monthly Cost=	$ 23.36	$ 16.94

BCM default values

Density	Data	Total
<=5	Sum of # Households	62,645
	Average of Loop Length	81,872.32
	Average of Loop $ per HH	4,513.14
	Average of Total Invstmnt/Ln	4,687.32
>2550	Sum of # Households	364,583
	Average of Loop Length	8,070.19
	Average of Loop $ per HH	218.26
	Average of Total Invstmnt/Ln	392.44
200 to 650	Sum of # Households	273,086
	Average of Loop Length	15,153.19
	Average of Loop $ per HH	430.99
	Average of Total Invstmnt/Ln	605.17
5 TO 200	Sum of # Households	372,988
	Average of Loop Length	28,234.15
	Average of Loop $ per HH	1,003.67
	Average of Total Invstmnt/Ln	1,177.85
650 to 850	Sum of # Households	109,294
	Average of Loop Length	12,680.94
	Average of Loop $ per HH	332.85
	Average of Total Invstmnt/Ln	507.03
850 to 2550	Sum of # Households	689,169
	Average of Loop Length	11,045.12
	Average of Loop $ per HH	323.62
	Average of Total Invstmnt/Ln	497.80

Density	Data	Total
<=5	Average of Monthly Cost1	123.73
	Average of Monthly Cost2	89.72
>2550	Average of Monthly Cost1	10.36
	Average of Monthly Cost2	7.51
200 to 650	Average of Monthly Cost1	15.97
	Average of Monthly Cost2	11.58
5 TO 200	Average of Monthly Cost1	31.09
	Average of Monthly Cost2	22.55
650 to 850	Average of Monthly Cost1	13.38
	Average of Monthly Cost2	9.71
850 to 2550	Average of Monthly Cost1	13.14
	Average of Monthly Cost2	9.53

	ARMIS	DIRECT
Aggregate Support at $20=	$ 119,470,421	$ 61,393,675
Aggregate Support at $30=	$ 77,571,518	$ 41,171,091
Aggregate Support at $40=	$ 58,629,033	$ 30,674,620
Annual Benchmark Cost =	$ 453,523,976	$ 328,869,847
State Average Monthly Cost=	$ 20.19	$ 14.64

Per line switch cost of $167

Density	Data	Total
<=5	Sum of # Households	62,645
	Average of Loop Length	81,872.32
	Average of Loop $ per HH	4,513.14
	Average of Total Invstmnt/Ln	4,652.90
>2550	Sum of # Households	364,583
	Average of Loop Length	8,070.19
	Average of Loop $ per HH	218.26
	Average of Total Invstmnt/Ln	358.02
200 to 650	Sum of # Households	273,086
	Average of Loop Length	15,153.19
	Average of Loop $ per HH	430.99
	Average of Total Invstmnt/Ln	570.75
5 TO 200	Sum of # Households	372,988
	Average of Loop Length	28,234.15
	Average of Loop $ per HH	1,003.67
	Average of Total Invstmnt/Ln	1,143.43
650 to 850	Sum of # Households	109,294
	Average of Loop Length	12,680.94
	Average of Loop $ per HH	332.85
	Average of Total Invstmnt/Ln	472.61
850 to 2550	Sum of # Households	689,169
	Average of Loop Length	11,045.12
	Average of Loop $ per HH	323.62
	Average of Total Invstmnt/Ln	463.38

Density	Data	Total
<=5	Average of Monthly Cost1	122.82
	Average of Monthly Cost2	89.06
>2550	Average of Monthly Cost1	9.45
	Average of Monthly Cost2	6.85
200 to 650	Average of Monthly Cost1	15.07
	Average of Monthly Cost2	10.93
5 TO 200	Average of Monthly Cost1	30.18
	Average of Monthly Cost2	21.89
650 to 850	Average of Monthly Cost1	12.48
	Average of Monthly Cost2	9.05
850 to 2550	Average of Monthly Cost1	12.23
	Average of Monthly Cost2	8.87

	ARMIS	DIRECT
Aggregate Support at $20=	$ 113,570,419	$ 59,341,001
Aggregate Support at $30=	$ 75,273,996	$ 40,322,327
Aggregate Support at $40=	$ 57,389,802	$ 30,099,574
Annual Benchmark Cost =	$ 433,116,619	$ 314,071,590
State Average Monthly Cost=	$ 19.28	$ 13.98

Per Line Switch Cost $134

Density	Data	Total
<=5	Sum of # Households	62,645
	Average of Loop Length	81,872.32
	Average of Loop $ per HH	6,165.65
	Average of Total Invstmnt/Ln	6,828.91
>2550	Sum of # Households	364,583
	Average of Loop Length	8,070.19
	Average of Loop $ per HH	198.98
	Average of Total Invstmnt/Ln	459.98
200 to 650	Sum of # Households	273,086
	Average of Loop Length	15,153.19
	Average of Loop $ per HH	356.31
	Average of Total Invstmnt/Ln	643.22
5 TO 200	Sum of # Households	372,988
	Average of Loop Length	28,234.15
	Average of Loop $ per HH	1,004.50
	Average of Total Invstmnt/Ln	1,356.96
650 to 850	Sum of # Households	109,294
	Average of Loop Length	12,680.94
	Average of Loop $ per HH	293.74
	Average of Total Invstmnt/Ln	564.94
850 to 2550	Sum of # Households	689,169
	Average of Loop Length	11,045.12
	Average of Loop $ per HH	294.19
	Average of Total Invstmnt/Ln	560.32

Density	Data	Total
<=5	Average of Monthly Cost1	180.26
	Average of Monthly Cost2	130.72
>2550	Average of Monthly Cost1	12.14
	Average of Monthly Cost2	8.80
200 to 650	Average of Monthly Cost1	16.98
	Average of Monthly Cost2	12.31
5 TO 200	Average of Monthly Cost1	35.82
	Average of Monthly Cost2	25.97
650 to 850	Average of Monthly Cost1	14.91
	Average of Monthly Cost2	10.81
850 to 2550	Average of Monthly Cost1	14.79
	Average of Monthly Cost2	10.73

	ARMIS	DIRECT
Aggregate Support at $20=	$ 103,314,450	$ 48,571,167
Aggregate Support at $30=	$ 61,240,643	$ 32,111,266
Aggregate Support at $40=	$ 45,835,500	$ 23,393,228
Annual Benchmark Cost =	$ 459,336,297	$ 333,084,613
State Average Monthly Cost=	$ 20.45	$ 14.83

Fill Factors of 95% for Cable Feeder and Distribution
New Cable Multipliers